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**How NG911 Technology May Positively Impact Mental Health in 9-1-1:
Evidence from Research and Theory on PTSD**

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Next Generation 9-1-1 (NG911) Is Here

Next Generation 9-1-1 (NG911) is an initiative aimed at improving infrastructure and using technology to enhance 9-1-1 services in a society that has become increasingly wireless. NG911 is no longer a mandate with vague timelines and questions regarding technological readiness. NG911 is here. Before the conclusion of 2022, many communication centers will have begun testing and adopting NG911 technology, with some centers already consistently using the technology. Over the next few years, NG911 technology will continue to sweep the nation and globe.

Integration of this technology into the 9-1-1 environment will help save lives. Yet, significant technological shifts reasonably raise anxiety among an already underpowered 9-1-1 workforce. Further, visual contact with potentially distressing or traumatizing events have made many individuals within the industry question the adverse psychological impact that NG911 may have on the workforce. This paper discusses the potential psychological impact of NG911 on the 9-1-1 workforce. Precise estimates of adverse impact are impossible to estimate; however, theory and empirical evidence related to conditions such as posttraumatic stress disorder (PTSD) can be used to guide our thinking. The research literature leads to a reasonable conclusion to while some, if not a minority, of calls might enhance risk for adverse psychological impact, there are compelling arguments that access to video may have net beneficial psychological impacts within 9-1-1. This paper concludes with recommendations for prevention and early intervention that may mitigate some of the risk associated with adoption of NG911 technology.

Stress in Native 9-1-1

On the eve of significant technological change, anxiety is inevitable. The anxiety likely stems from concern over employees' willingness and ability to engage with the new technology

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effectively. Based on the robust research on stress, and factors that cause stress, these reactions are understandable. Specifically, a long-standing literature identifies four factors that are consistently linked to reports of stress: novelty, predictability, control, and evaluation¹⁻¹⁰. (Averill, 1973; Dickerson & Kemeny, 2004; Gruenewald, Kemeny, Aziz, & Fahey, 2004; Miller, 1979; Miller, 1981; Monat, Averill, & Lazarus, 1972; Pfister, 1979; Sapolsky, 1994; Tamashiro et al., 2005; Tetrick & LaRocco, 1987; Zakowski, 1995). Individuals report greater stress when they are dealing with a new event or stimulus. This is amplified under conditions of low predictability and is further exacerbated when control of the event, stimulus, or technology is low. Finally, stress is increased when social evaluation is present. These four factors maintain a consistent presence in the 9-1-1 environment, as telecommunicators are often engaging with a novel stimulus or event, are unable to predict the nature of the call that they are about to answer, often have limited or no control over what is occurring on the other end, and are subject to constant evaluation through the industry's emphasis on quality assurance, as well as the freedom of information act that allows a call to be reviewed by anyone in the general public. When you add in shift work schedules, mandatory overtime, and persistent under-staffing, 9-1-1 communication centers can become highly stressed work environments.

Under normal 9-1-1 work conditions, the potential for stress is prevalent. The adoption of NG911 technology will reasonably increase technostress. Technostress is considered a negative psychological state that results from being required to use, or being threatened to use, new technologies¹¹ (Ayyagari, Grover, & Purvis, 2011). Research has shown that technostress is associated with risk for anxiety, mental fatigue, skepticism, and feelings of ineffectiveness¹¹ (Ayyagari et al., 2011). In a sample of 9-1-1 telecommunicators in the Pacific Northwest of the United States, greater technostress was associated with heightened reports of perceived stress¹²

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(Meischke et al., 2015). As NG911 technology continues to advance, particularly with new integration of video, technostress will likely increase. The stress associated with integration of live video is heightened by perceptions of limited control. Namely, front-line telecommunicators have limited control over the political and economic factors that are critical in determining when and where NG911 technology will be implemented. Employees also perceive limited control over whether they will be required to train on the new technology, as some have debated the merits of employees self-selecting into the training pool. All of these reactions and questions are unsurprising based on the empirical work regarding predictors of stress.

Psychological Conditions in Native 9-1-1

While concerns of technostress have been raised, a more deeply feared outcome of NG911 technology has entered into conversations at industry conferences and communication center workrooms over the past decade. Specifically, 9-1-1 telecommunicators working in the NG911 generation will now visually witness trauma. Telecommunicators processing calls will now be visually confronted with callers who are in peril, distress, or severely injured. They may witness assault in the moment, or watch a caller perish due to natural causes, self-inflicted causes, or at the hands of another human being. There will be video calls containing graphic material that would reasonably cause a high level of emotional distress in any individual. Notably, greater emotional distress in the moment of an event has been consistently and robustly linked with risk to conditions such as posttraumatic stress disorder (PTSD)^{13,14}. ; Brunet et al., 2001; Ozer, Best, Lipsey, & Weiss, 2008).

These concerns should not be dismissed or under-estimated. Prior to NG911, research revealed that 17.6% to 24.6% of 9-1-1 telecommunicators in a large sample in the United States met cut-off for probable PTSD¹⁵ (Lilly & Allen, 2015), a rate that is five to six times greater than

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in the general population¹⁶ (Kilpatrick et al., 2013), two to four times greater than a recent sample of firefighters (6.4%)¹⁷ ; Meyer et al., 2012), and an elevated but overlapping rate compared to a more recent sample of police officers (7% - 19%)¹⁸ ; Galatzer-Levy, Madan, Neylan, Henn-Haase, & Marmar, 2011). Additionally, 23.9% of the sample met cut-off for probable major depression¹⁵ (Lilly & Allen, 2015) compared to 7.1% in the general population as reported by the National Institute of Health (www.nimh.nih.org). Further, 53.4% of the sample reported a body mass index (BMI) in the obese range¹⁹ (Lilly, London, & Mercer, 2016) compared to 39.8% in the US general population (www.cdc.gov/obesity/data/adult.html). As these data were collected prior to NG911-related technological shifts, future research will be able to investigate, at least on a broad scale, whether psychological and physical health is altered by adoption of NG911 technology. It is also important to note that these data were collected prior to the COVID-19 global pandemic, which has been associated with increased mental health needs among the general population (www.cdc.gov) and among law enforcement officers²⁰ (Lilly & Curry, 2020).

Psychological health in native 9-1-1 leaves much to be desired. While telecommunicators are resilient, the prevalence of conditions such as PTSD and depression is concerning and makes evident the continued need for prevention and intervention efforts at both the individual and organizational levels. Exposure to graphic material present in some calls could enhance stress, and in some cases, could lead to heightened distress. There is truly no research to guide and predict this, though we do know that more distress and more dissociative reactions (e.g., feeling outside of one's body, feeling as though one is watching him or herself from another place in the room) in the moment of trauma is a powerful predictor of PTSD¹⁴ (Ozer et al., 2008). This can very reasonably happen with visual material that is particularly gruesome and disturbing in

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content. As such, some of the concerns among the 9-1-1 industry are well-founded. Agencies must be proactive in addressing mental health and wellness in their agency prior to its adoption, and must integrate the technology responsibly by being intentional and informed in decision-making, and committed to training, wellness, and clear communication within the communication center. While integration of NG911 technology will require all of these things for successful adoption, from a clinical and research standpoint, adoption of NG911 technology could lead to a number of benefits for the 9-1-1 workforce.

Potential Positive Impacts of NG911

Given the information provided, a reader may conclude that NG911 will have a net negative impact on the 9-1-1 workforce. Yet, making this conclusion is premature and fails to consider the potential for salutary impacts resulting from access to live video. The potential for positive impact follows directly from theory and replicated empirical findings on PTSD. Specifically, access to live video may have a net positive impact given that it may: (1) reduce feelings of helplessness and increase a sense of agency, (2) reduce guilt and self-blame, (3) provide visual contact, which has a documented positive impact on stress, (4) provide information on event severity, and (5) provide information on call outcomes.

Reduced Feelings of Helplessness. It is not uncommon for an emergency call to include some barrier to communication. The barrier may occur because the caller is too injured or physically distressed to communicate, or may be disoriented and unable to provide an accurate address or summary of their environment. In an increasingly diverse United States, language barriers add potential for miscommunication and added stress. The adverse impact on a telecommunicator attempting to dispatch services can be profound when any, or all, of these barriers are present. These calls can breed deep feelings of helplessness, which have been linked

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to risk for PTSD and depression^{14,21} (Brunet et al., 2001; Ozer, Best, Lipsey, & Weiss, 2008). In fact, peritraumatic distress (i.e., strong negative emotions during a potentially traumatizing event) was correlated with every mental health outcome in the nationwide sample described earlier, including PTSD, depression, anxiety, somatization (i.e., physical health complaints with no known medical cause), anger, and hostility^{15,19} (Lilly & Allen, 2015; Lilly, London, & Mercer, 2016). In looking at individual items from the Peritraumatic Distress Inventory, the strongest correlations to mental health outcomes were observed for the following items: “I felt helpless to do more,” “I felt frustrated or angry I could not do more,” and “I felt guilt that more was not done.” The correlations for these items (ranging from $r = .26$ to $.37$) were stronger than for items such as “I felt sadness and grief,” and “I felt worried about the safety of others,” which had correlations ranging from $r = .11$ to $.19$.

Though having access to live video could sometimes increase a sense of helplessness by visually depicting a potentially traumatizing scene over which the telecommunicator has limited control, having access to information that can save lives may reduce the helplessness experienced in the moment when lack of information is a barrier to effective responding. This is in line with others' work, which has found that not being in direct contact with the event can lead telecommunicators to experience feelings of helplessness and diminished self-efficacy^{22,23} (Adams, Shakespeare-Finch, & Armstrong, 2015; Shakespeare-Finch, Rees, & Armstrong, 2015).

Reduced guilt and self-blame. Relatedly, losing a life due to lack of key information often engenders a strong sense of self-blame or guilt. Telecommunicators may fault themselves for the outcome of the call, believing that if they had done things differently or asked different questions, the outcome may have changed. Guilt and self-blame are often core features of PTSD,

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depression, and suicidal ideation²⁴⁻³⁰ (Beck et al., 2011; Browne, Evangeli, & Greenberg, 2012; Browne, Trim, Myers, & Norman, 2015; Bryan, Morrow, Etienne, & Ray-Sannerud, 2013; Held, Owens, Schumm, Chard, & Hansel, 2011; Henning & Frueh, 1997; Kim, Thibodeau, & Jorgensen, 2011). These negative social emotions are often connected to two coping methods that tend to prolong symptomatology. The first is rumination. Rumination is a repetitive focus on past experiences, emotions experienced, and the causes and consequences³¹⁻³³ (Nolen-Hoeksema et al., 2008; Trapnell & Campbell, 1999; Watkins, 2008). Another coping strategy used to manage negative emotion is avoidance. Avoidance coping is a broad term that encompasses suppression of emotional expression³⁴ (Gross, 1998) and experiential avoidance (i.e., suppression or avoidance of thoughts, emotions, sensations, and memories³⁵; Hayes et al., 1999). Both rumination and avoidance coping are implicated in PTSD, depression, and anxiety, with large effects for rumination in predicting psychopathology^{36,37} (Aldao, Nolen-Hoeksema, & Schweitzer, 2010; Seligowski, Lee, Bardeen, & Orcutt, 2014) and medium to large effects for avoidance predicting psychopathology^{36,37} (Aldao et al., 2010; Seligowski et al., 2014). Rumination leads individuals to continue the cycle of guilt and self-blame, and becomes a closed cognitive loop that is resistant to change or reprocessing. Primary reliance on avoidance coping prevents the natural recovery process.

As a way of example, a telecommunicator may experience distress thinking about a call and tell him/herself that “I should have known better.” This self-blaming cognition heightens distress and results in further attempts to avoid thinking about the event. However, if avoidance was not used and the telecommunicator processed the event in the context of peer support or a professional relationship with a mental health practitioner, the telecommunicator may evaluate the evidence of whether they were truly to blame by breaking down the event and challenging

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misattributions. Through processing, the employee may realize that there was nothing that could have been done to change the outcome of the event, thereby reducing blame and guilt. Access to live video may reduce guilt and self-blame, as the telecommunicator's access to greater information may enhance the likelihood of a successful resolution. It may also reduce guilt and self-blame if there is visual evidence that the telecommunicator provided everything that could have been provided during a call.

Some may say that access to all of the information that is available, and having a caller still perish, may increase guilt and blame. That may be true and we cannot know for certain. However, having access to as much information as is available may lead to healthier conclusions that there was nothing else that could have been done. A telecommunicator may still feel sad, but the guilt and blame may be less prominent emotions. Compassion satisfaction, which includes positive feelings derived from helping others, contributing to the greater good, and working with suffering individuals, has also been proposed as a potential buffer to the negative outcomes associated with work as a 9-1-1 telecommunicator^{12,38} (e.g., Figley, 2013; Meischke et al., 2015). It is reasonable to predict that being able to provide more details that aid in saving a life or preventing further injury would enhance compassion satisfaction.

Benefits of Viewing. There has long been an assumption in the public safety industry that telecommunicators' remote location protects them from the ill-effects of trauma exposure, with the argument that field responders with direct access will be at heightened risk. As a reminder, there is not current support for this conclusion from the empirical literature, which shows that telecommunicators are at equal or greater risk for PTSD than firefighters and police officers¹⁵ (Lilly & Allen, 2015). Recent evidence from the cognitive psychology field may provide some explanation for these findings. Across a number of studies, research has shown that

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participants who listened to a story had stronger physiological reactions than participants who watched videos of the same story. Richardson et al.³⁹, for instance, observed a higher average heart rate and increase in body temperature among participants who listened to a scene versus watched the same scene on video. A greater increase in body temperature demonstrates that listener's autonomic nervous system (ANS) was more engaged and reactive than was seen in viewers reactions, which may indicate a greater sense of threat among listeners than viewers. In similar studies, researchers have found higher ectodermal activity, a measure of emotional arousal, among listeners than viewers^{40,41} (Critchley, 2002; Sequeira, Hot, Silvert, & Delplanque, 2009).

These studies have direct implications for 9-1-1 telecommunicators who may now transition to video. In the Richardson et al.³⁹ (2018) study, participants engaged with the audio material for approximately six minutes. This duration is not comparable to telecommunicator's exposure, as telecommunicators listen to calls day in and day out. In fact, research has shown that a typical 12-hour 9-1-1 shift entails an estimated 10.5 hours of listening to between 40 and 120 calls separated by a six-second resting-period^{42,43} (Dicks, 2014; Wiegand, 2013), some of which may be intense or distressing. By extension, prolonged exposure to distressing audio calls might lead to dysregulation in ANS functioning, increasing the likelihood for stress-related disorders (e.g., PTSD)⁴⁴ ; Cacioppo et al., 1998; 2000) and weaker immune systems⁴⁵ (Maier & Watkins, 1998). Though the benefits of having access to video cannot yet be determined, the research from the cognitive literature suggests that viewing material results in lower stress reactivity than listening alone.

Information on Injury Severity. Having access to visual information may also show that the injuries experienced by a caller are not as severe or life-threatening as the caller has

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reported. This may be especially true with callers who have limited medical experience or have strong reactions to injury or blood. Cuts to the head, for example, often result in significant blood flow given the number of blood vessels and level of oxygen circulating through the head. As a parent, for example, one might see a significant amount of blood coming from an injured child's head and have a strong emotional reaction. Simply cleaning the wound would demonstrate that the injury is not severe, and may not even need medical attention. However, processing a call from a hysterical parent who fears for their child's life could reasonably raise the emotional response of a telecommunicator, particularly a telecommunicator who is also a parent. Access to visual information and being able to walk a parent through preliminary medical care could create a greater sense of control and restore a greater sense of calm to the scene. Having visual access to the scene removes the potentially harmful mental machinations that could result from not being physically present. Said differently, access to video will take telecommunicators' imagination out of processing the call, which in some cases could be inaccurate, catastrophic imaginings about the scene.

Information on Outcome. Another empirically-derived conjecture regarding NG911 benefits is the potential to know more regarding the outcome of the call, particularly in instances of more mild injuries. Information processing theory has been used to explain a number of clinical conditions, including depression⁴⁵ (Beck, Rush, Shaw, & Emery, 1979) and PTSD^{46,47} (Resick & Schnicke, 1990, 1992). The world is replete with sensory information, and at every moment, a vast array of data must be organized coherently. To assist in the absorption and encoding of this information, humans rely on schemas. Schemas are structured cognitive frameworks developed as a result of one's knowledge and history. An individual's schemas guide how the individual will attend to their environment, the expectations that the individual

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will have for outcomes, how the individual will interpret their experiences, and impact how information is remembered and retrieved at a later time⁴⁸ (Williams, Watts, MacLeod, & Mathews, 1988). Ultimately, incoming information is typically assimilated into pre-existing schemas. One could equate it to a computational error when information cannot be appropriately assimilated into our schemas of how the world works. In sum, our brains like clear, coherent narratives that have a beginning, middle, and end, and are consistent with the schemas that we already hold about the world.

In addition to the many ways in which an event can challenge our schemas, one particular challenge is when an individual does not know the outcome of an event. When the outcome is unknown, there is difficulty integrating the event into pre-existing schemas that are complete and coherent in nature. Notably, memories that are fragmented or with missing portions (such as the end) are a core feature of PTSD⁴⁹ (American Psychiatric Association, 2013). Information processing theory would predict that fragmented memories lead to an increase in reexperiencing symptoms, such as intrusive thoughts, memories, or nightmares, as the individual's brain continues to try to make sense of what occurred so that it can be integrated into the individual's schemas. At moments when the individual's guard is down (not defending against the memory), the memory comes back into the brain for further processing. However, these reexperiencing symptoms can be unwanted and distressing, causing the individual to feel as though the threat is still real and present. To cope, many individuals will begin using avoidance or suppression strategies. However, this leads to a prolongation of symptoms as the brain is never given a chance to fully process the event. To the extent that access to video assists in creating more coherent memories, and perhaps more importantly, complete memories, the effect on risk for PTSD should be positive.

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Preliminary Data. There is also some very preliminary data showing that the prevalence of PTSD does not differ between those with and without access to video calls. As part of the US project described earlier¹⁵ (Lilly & Allen, 2015), participants were asked whether they had ever processed a call that included access to live video. Of the sample, 56 participants reported having processed a live video call and reported on symptoms of PTSD associated with those calls. Among these individuals, 12.5% to 21.4% met cut-off for probable PTSD and 19.7% met cut-off for probable major depression. These preliminary data suggest that access to live video does not adversely impact psychological health at a level greater than typical 9-1-1 duties. Yet, these data must be interpreted with caution as: (a) there was a small subsample of telecommunicators who had experience processing these types of calls, and (b) how these individuals were specifically selected to handle these calls is unclear. It is possible that these individuals were selected because they were among the more resilient employees, and therefore, identified as among the first to be trained.

Net Gains and Losses

There remain many questions regarding what the true impact of NG911 will be on the 9-1-1 industry. Though an upsurge in stress may occur as communication centers transition to the new technology (i.e., technostress)¹¹, Ayyagari, 2011), there is currently no reason to believe that access to video will make handling 9-1-1 calls any more novel or unpredictable than audio calls. Conversely, there is likely a net gain in regard to control, as visual access to information about the scene may provide important information that leads to a successful call outcome. It can save lives. In regard to the fourth predictor of stress (i.e., social evaluation), this will continue in an industry that values high-quality performance. Though there may be particular emphasis on performance in the adoption of NG911, this upsurge in stress should diminish to levels

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equivalent to pre-NG911 levels. What we know from the stress and psychopathology literature brings reason to believe that having access to video can result in reduced physiological reactions and lower risk for conditions such as PTSD in the 9-1-1 workforce. Particularly distressing and horrific calls will occur, which are unavoidable and already present in the 9-1-1 work environment. That is, integration of NG911 technology will not change the percentage of critical calls that are handled by 9-1-1 telecommunicators, but may lead to better outcomes in those calls.

Responsible Adoption of NG911 Technology

This paper has used evidence from the empirical literature to argue that integration of NG911 technology may not have the deleterious and catastrophic impacts over which many have expressed concern. Yet, these arguments remain speculative and unforeseen complications may occur. Further, significant technological shifts in an already at-risk population may amplify stress and distress to levels that impair performance and thwart successful adoption of the technology. This may be especially true in communication centers that are struggling with understaffing, low morale, lack of wellness training and/or programming, and/or problems in interpersonal relations.

Using technological advances to save lives is imperative in the public safety industry. While economic and/or political considerations may delay adoption of NG911 technology for some centers, demonstration of its life-saving capability will likely be a catalyst for its rapid adoption in the next five to ten years. It is the task of the 9-1-1 industry to approach its adoption responsibly with proactive attempts to safeguard the most valuable commodity in the 9-1-1 industry – its workforce. As a starting point, the following recommendations should be considered.

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Integrate NG911 capabilities in workflows. Radical adoption of NG911 capabilities into any one call center is ill-advised. It is important to gradually integrate technology that allows for video or text into call center infrastructure. Gradual adoption can help telecommunicators transition more comfortably, and will allow management within centers to identify how the workforce is impacted and how infrastructure will need to adapt to suit the new capabilities. More gradual adoption can help telecommunicators learn and integrate the technology effectively, as well as recognize the potential for positive gains made by its integration. NG911 technology will allow telecommunicators to identify accurately a caller's location, as well as gather additional information from text, video, or other data streams that may be used to assist field responders. Agencies that are resourced to evaluate the health of the workforce prior to, during, and after introduction of these capabilities can help to identify areas of struggle that may be addressed with additional training on coping, resilience, stress management, or mental health. Systematic evaluation can also identify whether strained interpersonal relations within the center are hijacking employee attempts to be resilient and cope effectively.

Educate stakeholders. Though official statistics are not available, the 9-1-1 industry has long been plagued by high levels of job turnover. On the eve of a transition that may reasonably increase levels of stress among employees, stakeholders must be prepared early to consider and support the responsible adoption of NG911 technology. This may include a temporary increase in financial assistance to support the new technology, as well as securing services that will help to bolster the health and resilience of the 9-1-1 workforce. Stakeholders must consider the benefits and temporary struggles that may be encountered with the transition and plan accordingly, setting up their communication center for success. This may mean a temporary increase in funds allocated to training in mental health and stress management, as well as

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allocation of funds to identify and partner with trauma-focused providers in the community. That agencies will already be asked to allocate millions of dollars for the integration of NG911 technologies, the relatively minimal cost of protecting the wellness of the workforce should be considered a mandated line item.

Communicate with employees. It is critical that frontline telecommunicators are provided information on when and how NG911 technology will be adopted in their center. Believing that stress and anxiety is reduced by the provision of information on a “need to know” basis is misguided. Discussions focused on employee’s concerns and anxieties allow the workforce to feel heard and validated, restoring a greater sense of predictability and control, and reducing stress and technostress. Validation that the transition will likely be difficult at first, and may heighten stress and technostress, may empower employees to share their concerns and have their misassumptions addressed. For instance, many telecommunicators believe that they will be seen by callers, which some have reported as a concern. Discussion of how the technology works, by inviting representatives from technology developers to department meetings or roll calls, creates a collaborative process that is likely to reduce anxiety and increase job satisfaction. Discussion with employees on the benefits of NG911, as are outlined earlier in the manuscript, may quell anxiety and motivate employees to approach the technology. To accomplish this, agencies should hold regular sit-downs to listen to dispatchers’ concerns. To do this, the culture of the agency must be one in which the commitment to transparency and wellness are clear. That is to say that agencies with a culture problem are strongly advised to address problematic cultural dynamics, as poor morale and communication can impede the successful adoption of the new technology.

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Allow employees to self-select, at least to start. This recommendation may not always be possible. However, when possible, employees who experience a moderate to profound resistance to the change are likely to not adapt well. Employees who are already psychologically depleted may be accurately assessing the extent to which they can handle the temporary stress of learning and engaging with the new technology. These employees may also be accurately identifying the presence of personal triggers (i.e., seeing assault, witnessing distress children) that they believe will be easily activated by access to live video. Requiring all employees to be trained in the technology results in a loss of control and potential for revictimization among employees who are already struggling to perform successfully in the native 9-1-1 environment. However, as peers are trained with thoughtful and gradual integration and successfully navigate the new demands, others may be more likely to approach the technology with a greater sense of control and openness.

Divide and conquer, or turn off. A comprehensive discussion of the pitfalls of multitasking is outside the scope of this paper. Broadly, media multi-tasking has been shown across nearly 50 empirical studies to have a net negative impact on cognitive outcomes, with an effect size in the moderately large to large range⁵⁰ (Jeong & Hwang, 2016). Native 9-1-1 already requires advanced skills in multitasking among telecommunicators. Integration of video adds yet another modality that a telecommunicator must engage with and respond to, resulting in cognitive demands that may impair performance. At least in the beginning, emergency calls that integrate live video should be processed by multiple telecommunicators, with one telecommunicator tasked with processing information from the video and the other completing the tasks currently required in native 9-1-1. It is possible that the protocol will change as familiarity with the technology expands and the technology advances; however, requiring one

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telecommunicator to now add yet another channel of information to their duties sets up the telecommunicator, agency, and technology to fail. Further, agencies must think critically and make decisions about whether telecommunicators can turn off video in the event that it is distracting or distressing to a level that impairs performance, and support telecommunicators if and when they choose to turn off video during a call. If telecommunicators believe that they cannot control their engagement with video, and further believe that there will be negative repercussions if they turn off video during a call, the risk for stress and distress is greatly enhanced.

Comprehensive wellness programming and reduced workplace hostility. Despite the potential for psychological benefits described earlier, any significant technological change will bring stress, and possibly distress, among employees. Communication centers that are already struggling with poor morale, high turnover, interpersonal tensions, and workplace hostility are not well positioned to transition effectively, with current workplace pathology worsened by the transition. Many communication centers have one (or more) employee assistance programs (EAPs), yet these programs are often not used, and use of the programs often raises concerns among employees regarding confidentiality. EAPs are not enough. Communication centers must proactively implement strategies that include: training on PTSD and stress management from trained trauma psychologists, development and implementation of workplace wellness strategies and programming (e.g., physical health screening, peer support training, incentives for health behaviors), and assessment of (and intervention for) problematic workplace behaviors that will present obstacles and challenges to the successful integration of new technology.

Comprehensive hiring practices. Most communication centers have lengthy and comprehensive screening and hiring practices. Yet, some communication centers do not include

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an assessment of mental health functioning for potential employees. Potential employees who are struggling with a mood or anxiety condition, or subthreshold PTSD symptoms, are at greater risk for the development of later psychological suffering. Comprehensive psychological screenings have always been imperative in the 9-1-1 industry, but are especially important in this period of transition.

Do not require debriefing. This statement is likely to be met with some resistance in the industry. In care of their employees, many 9-1-1 centers have adopted debriefing practices that are instituted in the aftermath of critical incidents. To reduce stigma, many agencies require all employees involved in an incident to participate in debriefing. Though this mandate is well-intentioned, and was evidence-based early in the debriefing era⁵¹ (Everly & Boyle, 1999), subsequent review of the literature has shown that individuals exposed to debriefing failed to experience symptom relief while those who were not exposed showed improvement⁵² (van Emmerik et al., 2002). Data over the past 20 years have remained inconsistent in supporting debriefing as a required early prevention or intervention approach. In 9-1-1 telecommunicators in the nationwide sample described earlier, the data showed that, of individuals who attended a debriefing for their worst duty-related call, attendance at a debriefing was not associated with any mental or physical health benefits. Notably, 25% of the individuals who participated in debriefings reported that the debriefing was unhelpful or made things worse. Among individuals who were not debriefed, 30% reported that they would not have wanted to attend a debriefing, or believed that it “would have made things worse (for them).” Requiring an individual to attend a debriefing can result in the following: (a) exposure to distressing narratives told by colleagues that enhance one’s own distress, (b) exposure to conflicting narratives told by colleagues that can lead to a sense of confusion or lack of clarity, (c) new information that may lead to guilt or self-

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blame (e.g., a caller died), and (d) a perceived lack of control and agency over one's choices. As an example, one telecommunicator in the previously cited study shared that attendance at a mandatory debriefing made things far worse when the parents of an injured child attended the debriefing in a state of hysteria that drastically heightened the distress of the telecommunicator and "made the impact of that event long-lasting... I still have nightmares about it." In this case "it" was the memory of the parents, not the original incident. Had the telecommunicator not attended the debriefing, that particular call would have been experienced as far less distressing. It is not that debriefing is ineffective, as it can be immensely effective at reducing distress, providing a place for survivors to discuss early reactions, and identify whether follow up care may be necessary. However, debriefing should be voluntary.

Summary

Successful performance of the 9-1-1 workforce is a significant public health concern. The job is challenging in its cognitive demands (i.e., multi-tasking) and psychological demands (i.e., recurrent exposure to trauma). These demands can take their toll on the physical and psychological health of telecommunicators, as has been demonstrated in research conducted in the native 9-1-1 environment. While integration of NG911 technology, particularly video, has left many with reasonable concerns regarding the psychological impact of an already taxed workforce, there is evidence to believe that there may be numerous positive impacts that can result from access to video. The responsibility is on agencies to be thoughtful, careful, and proactive in addressing psychological health among employees before, during, and after its integration to protect the most valuable commodity in the 9-1-1 industry, its people.

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